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**Vishay Semiconductors** 

# Infrared Emitting Diode, 875 nm, GaAlAs



### DESCRIPTION

The TSHA5500 is an infrared, 875 nm emitting diode in GaAlAs on GaAlAs technology, molded in a clear, untinted plastic package.

### FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- Leads with stand-off
- Peak wavelength:  $\lambda_p = 875 \text{ nm}$
- High reliability
- Angle of half intensity:  $\phi = \pm 24^{\circ}$
- Low forward voltage
- Suitable for high pulse current operation
- · Good spectral matching with Si photodetectors
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

#### Note

\*\* Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

### APPLICATIONS

- Infrared remote control and free air data transmission systems with comfortable radiation angle
- This emitter is dedicated to systems with panes in transmission space between emitter and detector, because of the low absorbtion of 875 nm radiation in glass

PRODUCT SUMMARY					
COMPONENT	l <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)	
TSHA5500	30	± 24	875	600	

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSHA5500	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾	

Note

• MOQ: minimum order quantity

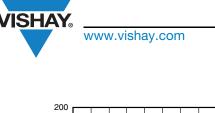
ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	5	V	
Forward current		I <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.5, t_p = 100 \ \mu s$	I <sub>FM</sub>	200	mA	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	2.5	А	
Power dissipation		Pv	180	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T <sub>amb</sub>	- 40 to + 85	°C	
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C	
Soldering temperature	$t \leq 5$ s, 2 mm from case	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R <sub>thJA</sub>	230	K/W	

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ROHS COMPLIANT





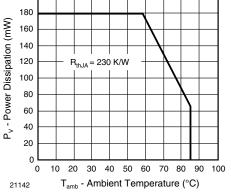


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

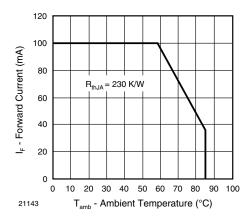


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.5	1.8	V	
Torward voltage	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	V <sub>F</sub>		2.8	3.5	V	
Temperature coefficient of $V_F$	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>		- 1.6		mV/K	
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			100	μA	
Junction capacitance	$V_{R} = 0 V, f = 1 MHz, E = 0$	Cj		20		pF	
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	l <sub>e</sub>	16	30	48	mW/sr	
	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	l <sub>e</sub>	128	240		mW/sr	
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	фе		24		mW	
Temperature coefficient of $\phi_{e}$	I <sub>F</sub> = 20 mA	ΤKφ <sub>e</sub>		- 0.7		%/K	
Angle of half intensity		φ		± 24		deg	
Peak wavelength	I <sub>F</sub> = 100 mA	λρ		875		nm	
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		80		nm	
Temperature coefficient of $\lambda_p$	I <sub>F</sub> = 100 mA	ΤΚλρ		0.2		nm/K	
Rise time	I <sub>F</sub> = 100 mA	t <sub>r</sub>		600		ns	
	I <sub>F</sub> = 1 A	t <sub>r</sub>		300		ns	
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		600		ns	
	I <sub>F</sub> = 1 A	t <sub>f</sub>		300		ns	
Virtual source diameter		d		2.2		mm	

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### BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

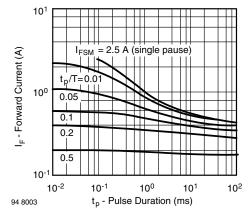


Fig. 3 - Pulse Forward Current vs. Pulse Duration

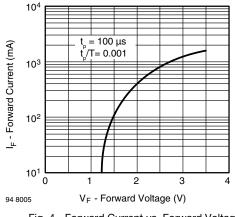


Fig. 4 - Forward Current vs. Forward Voltage

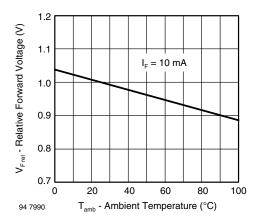


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

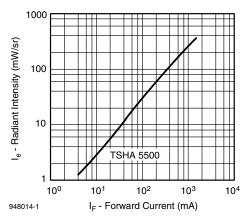


Fig. 6 - Radiant Intensity vs. Forward Current

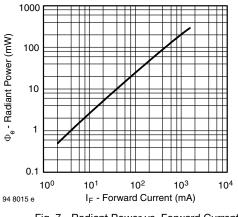


Fig. 7 - Radiant Power vs. Forward Current

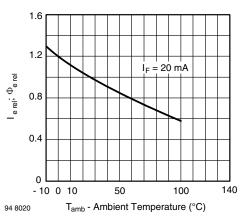
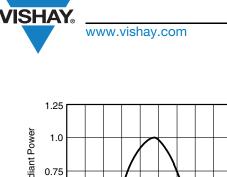


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

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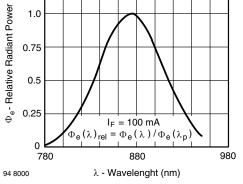
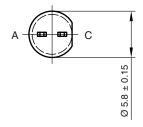
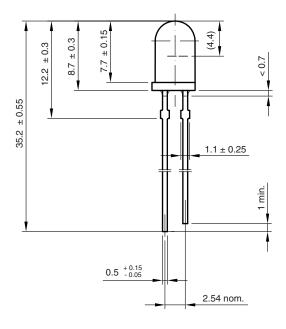


Fig. 9 - Relative Radiant Power vs. Wavelength







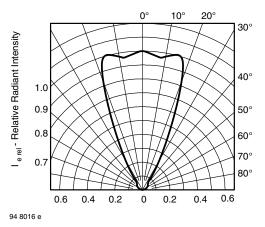
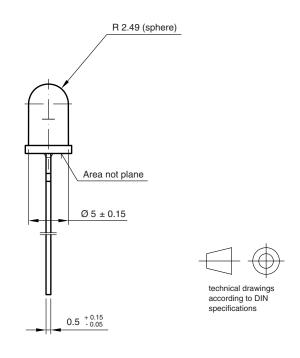


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement



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